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## THE Magazine gun as a muitary arm

Military authorities are by no means agreed that the magazine rifle is superior to the breech-loader for the use of the soldier ; and though Europe is hurriedly exchanging the former for the latter, the voice of indignant protest is making itself heard in the military journals, and with no uncertain sound. Who does not remember the zundnadelgewehr, or needle gun, and the great victory it won at Koniggratz (Sadowa), where, after a campaign of only forty days, the finest army Austria ever set afield was hopelessly beaten?

Though one of the first captains in Europe, Gen. Benedeck was no match for "Gen. Needlegun." This was in 1866. In 1870, the needle gun had another triumph, and backed by discipline and the power of rapid mobilization, it proved too much even for the much vaunted chassepot and mitrailleuse. Remembering what has been done by the needle gun, it is not surprising that there should be strong opposition to its withdrawal in favor of a successor of uncertain utility. At the first blush, it would seem as if a gun capable of being fired a dozen or more times without reloading ought to take precedence over one which must be reloaded after every discharge. Theoretically, it has a great advantage over the single firer; but as a military arm, to be used in the heat and amid the excitement of battle, there is a firm belief in some quarters that it will be found wanting. In some recent articles and letters in our German contemporary, the Militar Wochenblatt, the defects of the magazine gun as a military arm have been carefully pointed out; and while they have doubtless occurred to every one who is at all familiar with the school of the soldier and the art of war, it is interesting, in the light of present events, to review them.
The friends of the new arm, "M. 71-86," like to point out that it is the old, reliable "Mauser" single oader fitted with a magazine; but the mechanism of the old gun is simple, and of the present one complex.
It is not necessary for us, following our German contemporary, to discuss theimminency of another FrancoGerman war and the consequent danger,of adopting an arm which requires familiarity with new tactics. It is enough for the present purpose to look only at the possible relative advantages of the magazine and gingle firing gun. Even under the most favorable conditions, the magazine gun changes its range after each fire, because it is lighter by the weight of the fired cartridge. It is, of course, evident that, in the hands of a skillful man a cool and intelligent man, the raag: azine gun is a powerful weapon. But the average soldier, especially him from the rural districts, is awk ward, stupid, and excitable. Once let him get to work on the lever of the magazine gun, and it is ten to one he fires every shot in his magazine regardless of range, or breaks the lever; and if, as is likely, it should prove difficult to restrain his ardor, the quick handling of troops, change of front, and the like might be seriously impeded.

Whoever may have followed the various trials that have been made with the magazine gun in the hands of the common soldier, or at least those few which have been published, can scarcely fail of surprise that the great powers, one and all, should have decided to adopt it. Of course, it is to be expected that continual handling will bring a certain annount of precision; but in these days of great armies, when a million men are set afield by a single power, it is necessary to count the cost of learning to use a new weapbn, and to learn whether or no it may be relied upon in times of excitement, when roughly and awkwardly handled. It was only a few weeks ago when the 132 d of the line had a trial with the magazine gun. Now, this corps is to the general staff of the German army what the Black Watch is to the English army, what the Old Guard was to Napoleon, and the Tenth Legion to Cæsar. They fired over the target, and under it, and to one side of it, and, as if there was no such thing as keeping anything like a range, they no sooner refilled their magazines and started again, than the same ob served difierences were recorded. If the target could fred back, evon with single loaders, there would not havc been any hope for them. Surely, if whole corps practicing at the butts with single firers had exhausted ammunition in this reckless way, we should long since have been compelled to establish powder factories for each regiment; or go back to the cross bow and the sling.

## THE CELESTIAL WORED.

THE CONJUNCTION OF VENUS AND BATURN.
The near approach of two large planets is a note worthy event on astronomical annals. Such an event occurs on the 30th of May, at noonday, when Venu and Saturn are at their nearest point, Venus being 2 15' north of Saturn.
The planets are invisible to the naked eye at the
time of conjunction, but powerful telescopes will bring them out even in the full sanlight. The weitern sky however, will preent a charming picture otthe evenings of the 29th and 30th. Venus, the largest and most beautiful star that shines in the sky, is as easily recog
by means of the two first magnitude stars, Castor and Pollux, a few degrees north of the planet. On the 29th Saturn will be east of Venus, and on the 30th he will be found on the west of his brilliant rival.
The reason for the meeting and parting of the two planets may be easily explained. Venus is an inferior or inner planet, and as seen from the earth is moving astward or from the sun. Saturn is a superior or outer planet, and seems to be moving westward or toward the sun. When two planets are traveling, the one toward the east, like Venus, and the other toward the west, like Saturn, unless there be a change in their course, they must meet and pass on the celestial road. There comes a point when they are in the same right ascension or longitude. This condition of affairs takes place on the 30th, and the planets are then said to be n conjunction.
It is not only a pleasing spectacle to behold the queen of the stars and the ringed wonder of the skies in near proximity, but the interest of the meeting is increased by the near neighborhood of the stars Castor and Pollux. The beaming planets and two first magnitude stars form a rare picture of planetary and starry beauty, the shining quartet illustrating the contrast between inherent and reflected light.
The moon in her first quarter will add her soft light to the starry show, and the exhibition will continue until 10 o'clock, when the planets will slowly disappear behind the western hills.
It will be almost equally interesting to watch the planets as they approach each other before the $30 t h$ or as they recede from each other after the 30th.
three planets visible in virgo.
Jupiter, Uranus, and the asteroid Vesta are now in the constellation Virgo, and are all visible to the naked eye. An observer glancing at the eastern sky in the early evening will behold Jupiter in his most superb aspect as he slowly rises with stately step toward the meridian, holding as prominent a place in the east as Venus holds in the west. It will not be as easy to find his two companions with the unaided eye, and an opera glass will be an efficient aid in pointing out their position. But the feat may be accomplished if the moon be out of the way, the sky cloudless, the atmosphere pure, and the star-gazer possessed of good visual power. The bright star west of Jupiter is Spica. The distance between star and planet on the last of May is about $5^{\circ}$, which will be a guide in celestial measurement.

Uranus; the secord star of the trio, may be loaked for about $20^{\circ}$ north west of Jupiter and a little more than $2^{\circ}$ south of the third magnitude star Gamma Virginis. Vesta may be found about $12^{\circ}$ north of Jupiter and a few degrees northeast of the third magnitude star Zeta Virginis.

Uranus and Vesta shine as stars of the sixth magnitude, the smallest stars perceptible to the naked eye. Vesta is the largest of the family of 265 asteroids, and the only one visible to the unaided eye. She is less than 500 miles in diameter and yet looks to terrestrial observers as large as the giant planet Uranus, who is more than 31,000 miles in diameter. The great difference in the distance is the reason why the planets appear to be of the same size. Vesta circles round the sun at a mean distance of $230,000,000$ miles, while Uranus makes his vast circuit at a distance of more than $1,800,000,000$ miles. Therefore the tiny asteroid and the huge planet appear to mortal eyes of the same size. Both are shiningpoints barely perceptible to the

Jupiter, Vesta, and Uranus form an isosceles triangle, or one that is nearly so, of which Jupiter and Vesta are the base and Uranus is the summit.

## A New System of Boot Making.

The London(Eng.) Shoe and Leather Record describes system of fastening the soles to boots and shoes, in which the fastenings are driven from the inside, the fastenings being first placed in the insole and then the upper lasted over them. The fastening is of brass, with a conical front, barbed all around the point, and the head is flat and neatly formed. A machine is used to feed and drive the fastenings at regular distances through the insole. The insole is then laid on the last, with the barbed points standing erect. The upper is lasted over these points and pushed down, leaving suf ficient of the point still.above the upper to pierce half way through the sole. The sole is then laid on as though upon blinders, hammered down, and the process is complete. The hceling and finishing are performed in the ordinary way.

The A. A. Griffing Iron Co., of Jersey City, N. J., have issued a handsome illustrated catalogue of the Bundy patent radiators, which they make in so many sizes and styles, and in such great quantities, that it requires a very extended manufacturing plant to enable them to keep up with the demand. The facsimile tes timonials and lists of users of these radiators given in this volume, as to the excellence and efficiency of this method of heating, render further commendation sim ply superfluous.

